

Uncontrolled hypertension in sub-Saharan Africa: Now is the time to address a looming crisis

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Hypertension has become a major threat to the well-being of people in sub-Saharan Africa (sSA) as during the last several decades, the highest levels of blood pressure worldwide have shifted from high-income countries (HIC) to low- and middle-income countries (LMIC). The World Health Organization estimates that the prevalence of hypertension is highest in the African region, with about 46% of adults aged 25 years and older being hypertensive compared to 35% in the Americas and other HIC, and 40% elsewhere in the world.¹ Despite cost-effective lifestyle and medical interventions that could control hypertension and prevent death and disability, the African region still bears a very high disease prevalence, with poor rates of detection, treatment, and control. As the leading cause of death globally, accounting for over 10 million deaths per year, hypertension is an unfortunate emerging public health burden in sSA and represents a looming crisis. Of over 1.39 billion adults worldwide with hypertension in 2010, almost three times more individuals resided in LMIC vs HIC regions (1.04 billion in LMIC and 349 million in HIC).² The alarming increases in hypertension and associated cardiovascular disease (CVD) in sSA are fueled by the same risk factors identified in industrialized countries: increased sodium intake, higher body weights, and decreased physical activity.³ The social determinants of health fuel the rising incidence of hypertension and CVD in sSA, with poverty as a prominent underlying factor for the hindrance of patient care, with many patients earning <\$1 US dollar per day.

Considering the limited sSA data on the epidemiology of hypertensive crisis (systolic and/or diastolic blood pressure \geq 180/110 mm Hg), the recent report from the Buea Regional Hospital, Cameroon, is a welcomed addition to the medical literature. Nkoke, Clovis, and colleagues substantially add to our understanding of hypertensive crisis, including hypertensive urgency and hypertensive emergency in the African continent with a cross-sectional study from June 2018 until June 2019.⁴ Out of the 1536 patients admitted to Buea Regional, 95 (6.2%) had a hypertensive crisis, of which 56 (58.9%) had a hypertensive emergency. There were 49 (51.6%) men, and mean age was 51.1 ± 14.9 years. Although increasingly prevalent, hypertension in

sSA is often unrecognized in its earlier stages and alarmingly, despite a history of hypertension in 75.3% of the patients, only 24.2% were on treatment and 24.2% had chronic kidney disease (CKD). In addition, hypertensive emergency was unacceptably high in incidence, including acute left ventricular failure with pulmonary edema (44.6%), intracerebral hemorrhage (21.4%), and cerebral infarction (16.1%). These findings reflect the deadly consequences of hypertension crisis, with in-hospital case fatality at 6.3%.⁴

Although the authors cite older US data that 1%-2% of hypertensive patients will develop a hypertensive crisis, this is probably an overestimation of the contemporary status of hypertension in the United States.⁵ Indeed, hypertensive crisis is not inexorably the result of high blood pressure, but more accurately reflects the results of long-standing untreated or poorly controlled hypertension. Ideally, appropriate identification and control of hypertension should essentially eliminate the occurrence of hypertensive crisis, other than in unusual cases of secondary or identifiable causes of hypertension.

Despite recent data from Cameroon citing hypertension as highly prevalent in the country, including about 30% of the general population being affected, the actual burden of individuals may be significantly higher and growing.⁶ As SSA countries, including Cameroon, experience an epidemiological transition from communicable diseases, uncontrolled hypertension must be caught early, to mitigate and hopefully eliminate the unacceptable cases of hypertensive crisis as described by the authors.

Black populations, whether residing in Africa, the Caribbean, United States, or Europe, appear to develop hypertension earlier than other groups. Additionally, the 2020 International Society of Hypertension (ISH) guidelines report blacks incur organ damage at younger ages, with a higher frequency of resistant and nocturnal hypertension.⁷ Multiple contemporary major guidelines highlight the significance of race/ethnicity in hypertension prevalence and control.⁸ Similarly to findings in African Americans, hypertension in European blacks is higher than in the non-black populations, and

other global black populations have a high hypertension prevalence.⁹ As seen with American blacks, the presence of lower control rates is associated with more severe hypertension and possibly to less effective treatment.^{8,10}

The 2020 ISH guidelines report physiological differences including a suppressed renin-angiotensin system (RAS),^{11,12} increased cardiovascular reactivity,¹³ early vascular aging (large artery stiffness),¹⁴ and altered renal sodium handling.¹⁵ Nevertheless, there is no single gene or set of genes that clearly explains the high rates of hypertension across the African diaspora, and it is far from a consensus, as suggested by the 2020 ISH authors, that the high burden of hypertension in blacks vs other groups is mainly attributed to genetic differences. Another viewpoint is that the increased burden of hypertension in various populations of African descent is mainly a reflection of adverse diet, lifestyle, and socioeconomic status, which are also considered in the ISH 2020 report. Perhaps nature and nurture combine to affect several physiologic determinants associated with hypertension in persons of African descent, and this author has proposed that the increased prevalence and hypertension-related adverse outcomes in blacks are mainly due to environmental and lifestyle factors vs definitive genetic underpinnings.¹⁶

African Americans (non-Hispanic US blacks) have a high degree of racial admixture, with varying degrees of continental ancestry despite being self-identified as "black." Recent data from the Jackson Heart Study, a cohort of self-identified African Americans, investigated whether genetic linkage to continental African ancestry, and at least partly, explains the high hypertension burden of disease. Estimated West African ancestry (WAA) and blood pressure control did not differ across quartiles of WAA, suggesting there is no inherent WAA genetic make-up that explains poor hypertension control.¹⁷ Optimally, clinicians and public health officials across the African diaspora should emphasize proven approaches to hypertension identification and control vs accepting a genetic basis for suboptimal outcomes. On the other hand, the strongest genetic link to hypertension and target organ damage in blacks may be related to the higher risk of kidney disease.¹⁸ Overall, apolipoprotein 1 variants in persons of West African descent are a factor in patients with primary glomerulosclerosis and CKD.¹⁹

As experienced for years in the United States, in African Americans, community outreach and community health workers may improve linkage to care and potentially reduce blood pressure reduction.²⁰ The world in the year 2020 has been beset with a crushing morbidity and mortality due to infections from the coronavirus, SARS-CoV-2. Fertile ground to control the added ravages of uncontrolled hypertension in sSA would be to address medication access and adherence. During the COVID-19 pandemic in the United States and historically in sSA, in-person clinic visits are often difficult to arrange. Smartphone and web-based counseling may support patient-centered communication and potentially lead to positive changes in lifestyle, hypertension treatment, and clinically meaningful outcomes.

In consideration of limited availability of physicians in rural SSA, the use of smartphones and telehealth to control hypertension was investigated in the Optimizing Linkage and Retention to Hypertension Care in Rural Kenya study. The resulting blood pressure lowering was modest, but mobile technology may hold promise to curtail the growing burden of hypertension in sSA and may enhance continuity and coordination of care. Major barriers included notable poverty and lack of health insurance (80%), with more than one-half of the participants either unemployed or earning <\$1.50/day.²¹

What is clear is that effective management of hypertension is a prerequisite to diminish and eventually eliminate hypertensive crisis in sSA. In blacks, first-line pharmacological therapy, especially for middle-aged and older persons, may require a single-pill combination including a thiazide-like diuretic with a calcium channel blocker (CCB) or CCB with a RAS-inhibitor. Although angiotensin-converting enzyme inhibitors (ACE-Is) and angiotensin receptor blockers (ARBs) are less effective in blacks as monotherapy when compared to whites, combination therapy appears equally effective in whites and blacks.⁸ Since ACE-Is are also associated with a higher incidence of angioedema in blacks, ARBs are recommended over an ACE-I by the European Society of Cardiology and the European Society of Hypertension (ESC/ESH) and ISH guidelines for hypertension pharmacotherapy, usually with a diuretic or CCB.^{7,22,23} Accordingly, despite first-line superiority of diuretics and CCB's, the major guidelines all recommend two or more antihypertensive medications to achieve adequate blood pressure control in most blacks and with a blood pressure that is 20/10 mm Hg above the desired target, combination therapy should be offered at treatment onset. It is reasonable to expect in a population with higher levels of resistant hypertension, multidrug pharmacological therapy will be often indicated.

Specifically related to best practices in controlling hypertension in sSA, the recent Comparison of Three Combination Therapies in Lowering Blood Pressure in Black Africans (CREOLE) study evaluated two-drug combinations in native Africans. In 728 randomized sSA patients, amlodipine plus either hydrochlorothiazide or perindopril was more effective than perindopril plus hydrochlorothiazide at lowering blood pressure at 6 months. Hence, the CREOLE data support CCB-based regimens as efficacious in black African hypertensive patients.²⁴

As germane to the issue of hypertensive crisis, clinicians may approach hypertensive emergencies with the overall goal to safely control blood pressure, to prevent or limit further hypertensive damage, and avoid hypotension and related complications. Antihypertensive regimens are individualized, and there is a lack of randomized controlled trial data to provide clear-cut guidance on blood pressure targets and timelines to lower blood pressure. For example, acute pulmonary edema and aortic dissection require rapid blood pressure reduction.⁷

In consideration that most recommendations are based on expert consensus, availability of drugs, and local experience with individual drugs, it is understandable that the Buea Regional Hospital clinicians

most commonly used well-recognized drug classes to manage hypertensive crisis including intravenous diuretics (furosemide) in 24.2%, oral diuretics in 28.2%, and oral alpha-beta blocker (labetalol) in 44.4% of patients.⁴ The 2020 ISH recommendations note that labetalol and nicardipine are generally safe to use in all HE and should be available wherever hypertensive emergencies are being managed. Whereas, nitroglycerine and nitroprusside are specifically useful in HE including the heart and the aorta.⁷

In the final analysis, while the data from Cameroon remain important and informative, the real question is when and how the appropriate steps will be taken to curtail the looming crisis of uncontrolled hypertension and CVD and requires urgent action.²⁵ The Pan-African Society of Cardiology (PASCAR) has identified hypertension as the highest area of priority action to reduce heart disease and stroke on the continent. The recommendations of the PASCAR task force on hypertension proposed an effective strategy to achieve 25% control of hypertension by 2025.²⁵ Public health leadership in sSA must work with clinicians and the communities they serve to overcome the major barriers to hypertension control and hopefully diminish and eliminate the growing cases of hypertensive crisis and premature death.

CONFLICT OF INTEREST

None.

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